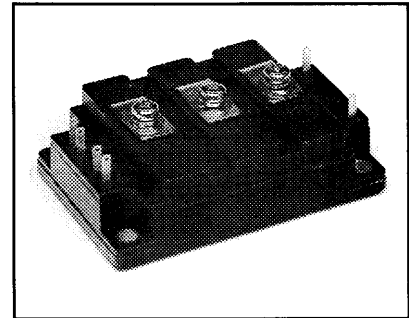
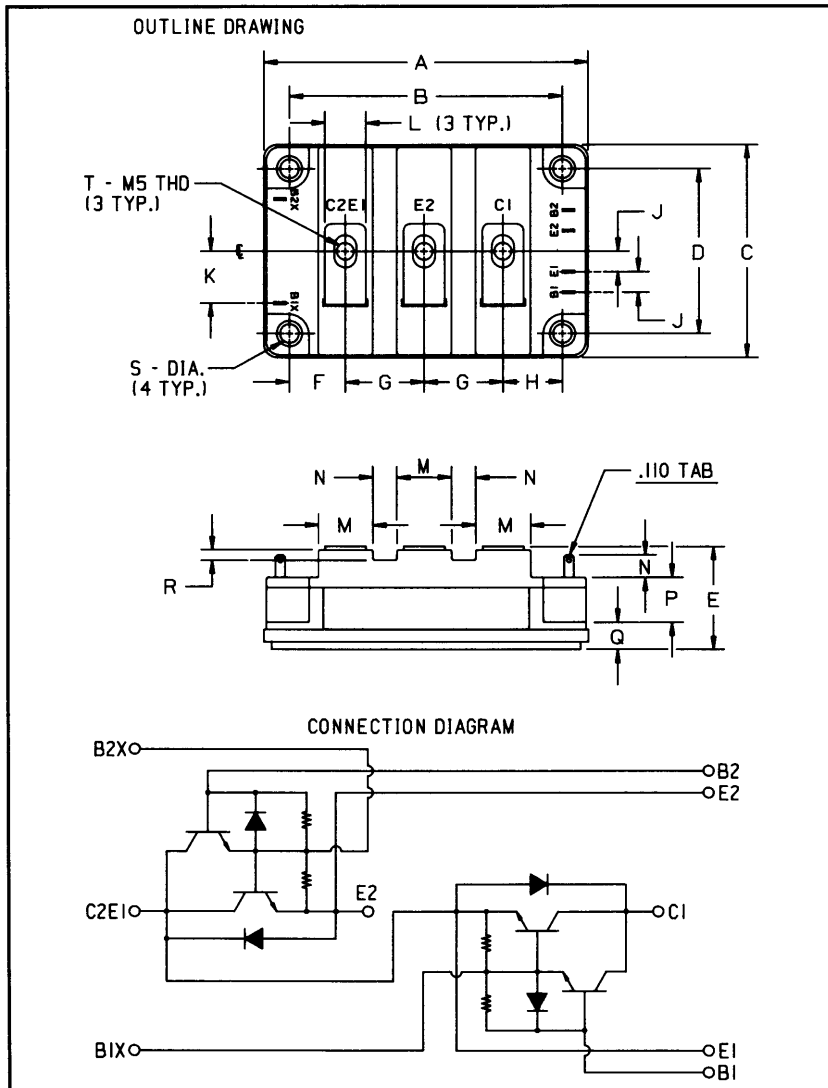


### Dual Darlington Transistor Module 100 Amperes/600 Volts



#### Description:

The Powerex Dual Darlington Transistor Modules are high power devices designed for use in switching applications. The modules are isolated, consisting of two Darlington Transistors with each transistor having a reverse parallel connected high-speed diode.

#### Features:

- Isolated Mounting
- Planar Chips
- Discrete Fast Recovery Feedback Diode
- High Gain ( $h_{FE}$ )
- Quick Connect Base-Emitter Signal Terminals
- Base-Emitter Speed-up Diodes

#### Applications:

- AC Motor Control
- DC Motor Control
- Switching Power Supplies
- Inverters

#### Ordering Information:

Example: Select the complete eight digit module part number you desire from the table - i.e. KD324510 is a 450  $V_{CE0(sus)}$  (600  $V_{CEV}$ ), 100 Ampere Dual Darlington Module.

Outline Drawing

Dimensions	Inches	Millimeters
A	3.740 Max.	95 Max.
B	3.150 ± 0.01	80 ± 0.25
C	2.441 Max.	62 Max.
D	1.890 ± 0.01	48 ± 0.25
E	1.181 Max.	30 Max.
F	0.650	16.5
G	0.906	23
H	0.689	17.5
J	0.236	6

Dimensions	Inches	Millimeters
K	0.596	15
L	0.472	12
M	0.630	16
N	0.276	7
P	0.512	13
Q	0.315	8
R	0.118	3
S	0.216 Dia.	5.5 Dia.
T	M5 Metric	M5

Type	$V_{CE0(sus)}$ Volts (X 10)	Current Rating Amperes (X 10)
KD32	45	10



Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272

**KD324510**  
**Dual Darlington Transistor Module**  
 100 Amperes/600 Volts

**Absolute Maximum Ratings,  $T_j = 25^\circ\text{C}$  unless otherwise specified**

Ratings	Symbol	KD324510	Units
Junction Temperature	$T_j$	-40 to 150	$^\circ\text{C}$
Storage Temperature	$T_{\text{stg}}$	-40 to 125	$^\circ\text{C}$
Collector-Emitter Sustaining Voltage	$V_{\text{CEO(sus)}}$	450	Volts
Collector-Emitter Sustaining Voltage, $V_{\text{BE}} = -2\text{V}$	$V_{\text{CEV(sus)}}$	600	Volts
Collector-Base Voltage	$V_{\text{CBO}}$	600	Volts
Emitter-Base Voltage	$V_{\text{EBO}}$	7	Volts
Collector-Emitter Voltage, $V_{\text{BE}} = -2\text{V}$	$V_{\text{CEV}}$	600	Volts
Continuous Collector Current	$I_C$	100	Amperes
Diode Forward Current	$I_{\text{FM}}$	100	Amperes
Continuous Base Current	$I_B$	6	Amperes
Diode Surge Current	$I_{\text{FSM}}$	1000	Amperes
Power Dissipation (Each Transistor)	$P_t$	620	Watts
Max. Mounting Torque M5 Terminal Screws	—	17	in.-lb.
Max. Mounting Torque M5 Mounting Screws	—	17	in.-lb.
Module Weight (Typical)	—	420	Grams
V Isolation	$V_{\text{RMS}}$	2500	Volts

**Electrical Characteristics,  $T_j = 25^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units	
Collector Cutoff Current	$I_{\text{CEV}}$	$V_{\text{CE}} = 600\text{V}, V_{\text{BE}} = -2\text{V}$	—	—	2	mA	
		$V_{\text{CE}} = 600\text{V}, V_{\text{BE}} = -2\text{V}, T_C = 125^\circ\text{C}$	—	—	15	mA	
Emitter Cutoff Current	$I_{\text{EBO}}$	$V_{\text{EB}} = 7\text{V}$	—	—	100	mA	
DC Current Gain	$h_{\text{FE}}$	$I_C = 100\text{A}, V_{\text{CE}} = 2\text{V}$	75	—	—	—	
		$I_C = 100\text{A}, V_{\text{CE}} = 5\text{V}$	100	—	—	—	
Diode Forward Voltage	$V_{\text{FM}}$	$I_{\text{FM}} = 100\text{A}$	—	—	1.75	Volts	
Collector-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$I_C = 100\text{A}, I_B = 1.3\text{A}$	—	—	2.0	Volts	
Base-Emitter Saturation Voltage	$V_{\text{BE(sat)}}$	$I_C = 100\text{A}, I_B = 1.3\text{A}$	—	—	2.5	Volts	
Resistive	Turn-on	$t_{\text{on}}$	$V_{\text{CC}} = 300\text{V}$	—	—	2.0	$\mu\text{s}$
Load	Storage Time	$t_s$	$I_C = 100\text{A}$	—	—	12	$\mu\text{s}$
Switch Times	Fall Time	$t_f$	$I_{\text{B1}} = 2\text{A}, I_{\text{B2}} = -2\text{A}$	—	—	3.0	$\mu\text{s}$

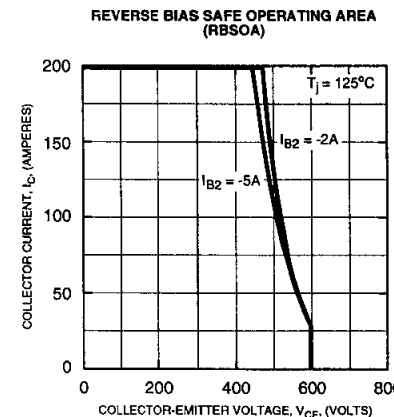
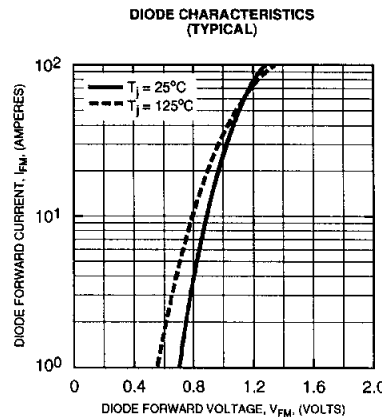
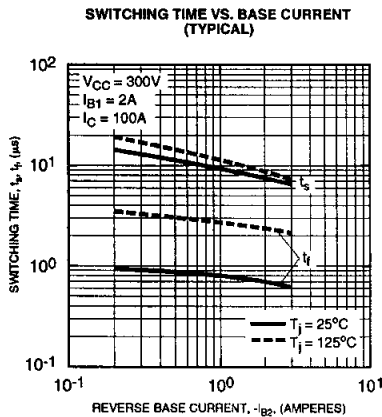
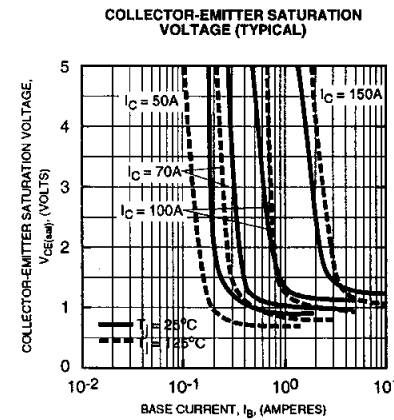
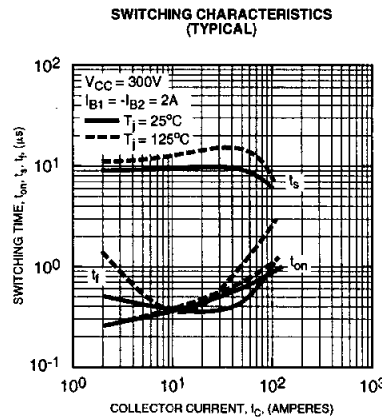
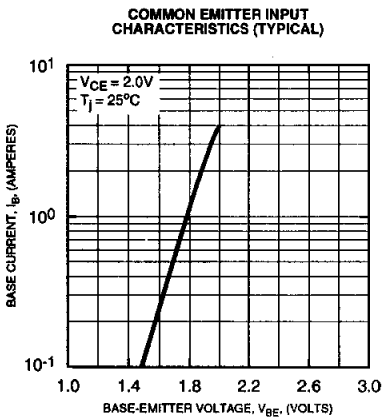
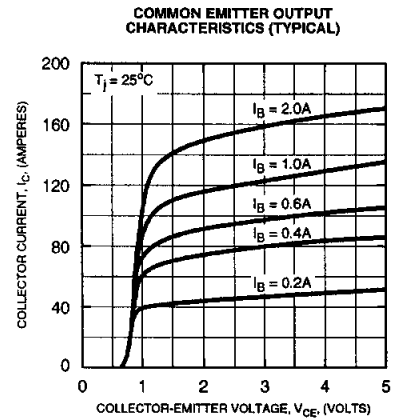
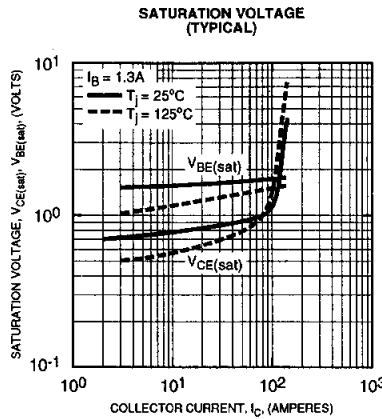
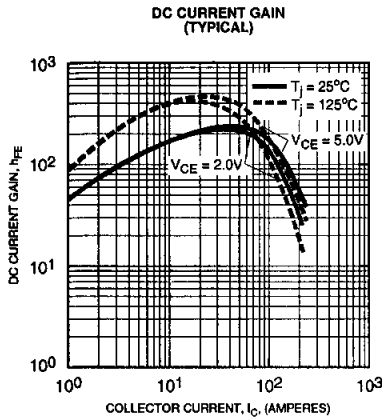
**Thermal and Mechanical Characteristics,  $T_j = 25^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Case-to-Sink	$R_{\theta(\text{c-s})}$	Per 1/2 Module	—	—	0.1	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(\text{j-c})}$	Transistor Part	—	—	0.2	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(\text{j-c})}$	Diode Part	—	—	0.65	$^\circ\text{C/W}$



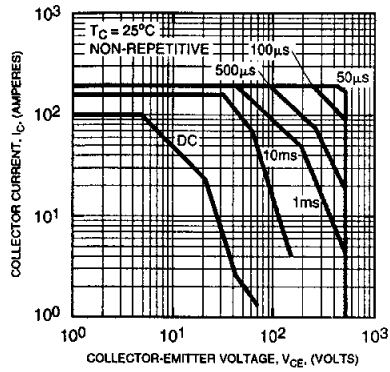
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**KD324510**  
**Dual Darlington Transistor Module**  
 100 Amperes/600 Volts

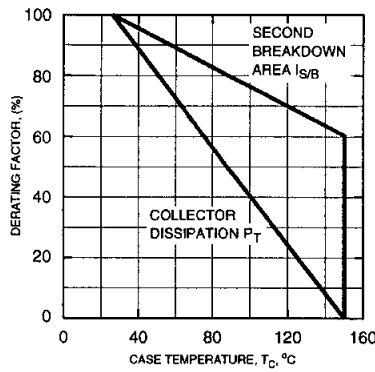


**KD324510**  
**Dual Darlington Transistor Module**  
 100 Amperes/600 Volts

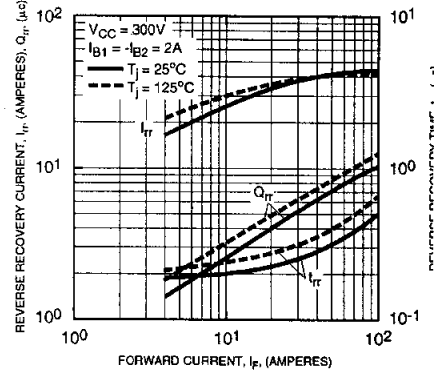
**FORWARD BIAS SAFE OPERATING AREA (SOA)**



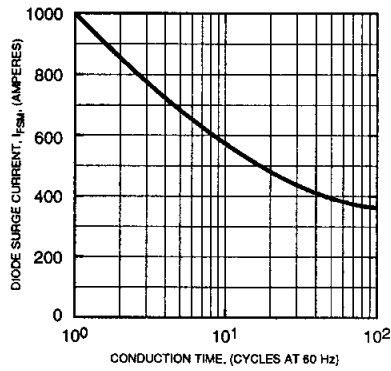
**DERATING FACTOR OF SAFE OPERATING AREA (SOA)**



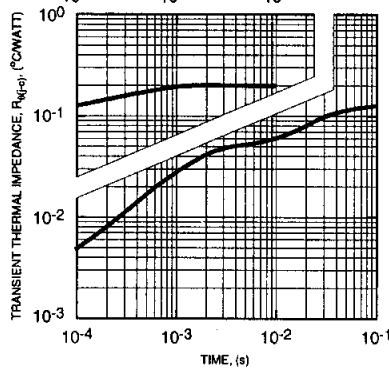
**REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)**



**DIODE FORWARD SURGE CURRENT**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)**

